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ABSTRACT

The following topics concerning research methodology for educational change are examined: (1) targets for change, (2) techniques for monitoring change, (3) time for change, and (4) testaments for change. (CK)

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RESEARCH MEMORANDUM

RESEARCH METHODOLOGY FOR EDUCATIONAL CHANGE

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In any consideration of research methodology for educational change, two basic questions loom large at the outset--namely, what is it that must be changed? and along which dimensions and in which direction should the change take place? A third important question concerning how the change is to be produced usually receives most of the attention, but often largely as a practical problem in the engineering of change, an approach that tends to be more concerned with means and procedures than it is with either of the other two issues--that is, either with the nature of the thing to be changed or with the goals or intended outcomes of the change process.

A research methodology provides a systematic way of looking at a problem, a mode of inquiry for eliciting information and evidence leading to understanding and problem solution. Rather than spending the brief time allotted here discussing particular methods or techniques of inquiry and analysis that might be useful in fostering educational change, let us instead focus upon some of the critical problems in the production of change and see what general methodological strategies or "ways of looking" seem called for. First, let us consider the nature of the base from which change is to be mounted--the nature of the educational arena, as it were, especially those features that are typically targeted for change and those features that tend to impede attempts at alteration. Then, we shall turn to a consideration of the basis for change, of the sources of the ideas underlying new plans and new goals for the educational enterprise.

Targets for Change

One of the most critical features of the educational arena is that it constitutes a system in the technical sense of a complex set of elements that functions as a whole by virtue of the interdependence of its parts.[1] There are many parties to the system--such as teachers, students, parents, principals, counsellors, communities, superintendents, school boards--and many parts and processes.

In one sense the system is highly dynamic, in that particular individuals involved frequently change or are replaced. Individual students flow through the various grades or levels of the system, for example, teachers are transferred or promoted, and some communities have such a high rate of population exchange that not only is considerable student replacement introduced within grade level but the community's social characteristics are gradually transformed. It seems likely that strategies of intervention and change will have to vary depending upon the rates of such population exchanges--that is, depending upon the degree of interdependence between particular individuals and the organization or system.

In another sense the system is highly stable, in that it displays a huge number of programmatic and behavioral regularities. Most programmatic regularities are intended to produce or to change behavioral regularities. For example, the inexorable programmatic regularity that confronts each student on every school day of every school year with numbers and mathematics is presumably intended to increase in cumulative fashion certain behavioral regularities in the student, as reflected in his repertoire for quantitative thinking and his level of mathematical mastery. The frequency and level or quality of these behavioral regularities, in turn, offer important

criteria for judging the extent to which the intended outcomes are being realized.

Not all of the existing behavioral regularities of students, teachers, or other participants in the system are intended outcomes or processes, however. Many of them reflect extraneous consistencies, while others represent unintended outcomes or side effects, which may be either desirable or undesirable. A finding, for example, that teachers ask questions in class at a very high rate, about 50 times as frequently as students do, and that a very large proportion of these questions require straight recall from the students is a behavioral regularity, to be sure, but is it an intended or a desirable state of affairs?

Since most of the impetus for educational change stems from someone noticing a regularity that he considers undesirable (or the absence of a regularity he considers desirable), it is not surprising that most efforts at change attack the offending regularity frontally. Failure to appreciate that the regularity is embedded in a system of interdependencies has double-edged consequences. To begin with, the successful modification of a part of the system may have unintended and possibly adverse effects in other parts of the system, thereby not improving matters very much overall. Furthermore, if the network of interdependencies supporting a regularity is overlooked, it cannot very well be countered, so there is little likelihood that circumscribed alterations will be successfully maintained in the face of inertial pressures toward reabsorption of the changed part back into the old pattern. The more things change, the more they stay the same. And the situation is even more intransigent than this, for we are dealing not only with a system but with a <u>culture</u>. The existing regularities are determined

and maintained by roles and expectations, attitudes and values, tradition and history. Under these circumstances, effective and long-range educational change requires not only individual change and program change but institutional change.

Let us briefly consider a case history of a recent intensive effort to modify some perceived undesirable regularities. The case concerns the introduction of the new math into the school curriculum. In reporting the results of a recent observational study, Sarason (1971) summarized the situation as follows:

> ...for some time before the first Russian Sputnik in 1957 there was a good deal of dissatisfaction with the teaching of mathematics in the public schools. The leadership of this dissatisfaction was primarily in the universities, and the content of the criticism took different forms. But on at least one point there was complete agreement--the way children were being taught math was an unmitigated bore and disaster that very few children could survive either in the sense that they experienced the joy of the world of numbers or pursued mathematics as a career. The Russian Sputnik catalyzed the effort to change the teaching of math, and various new maths were developed in university centers and introduced into the schools. After several years of the new math we observed...(its teaching) in a number of classrooms in several school systems....joy is the last word in the English language that one could apply to the children in those classrooms....If our observations and those of others have validity and generality, one would have to predict that the goal of more and better mathematicians and scientists...will not be met. If so, we will have another sad example of how the more things change the more they remain the same [pp. 19 & 46].

As Sarason (1971) points out, this conclusion is perhaps too generous, for not very much has basically changed at all. Why? To begin with, the original diagnosis of the problem focused upon a particular set of undesirable behavioral regularities and their presumed source in the programmatic regularities of the traditional mathematics curriculum; change was to be brought about through substituting a new set of regularities by means of

a new curriculum. Very little was said about teachers or the teaching process, nor was the problem formulated in such a way as to require the involvement of teachers as an integral part of the change effort. Furthermore, the impetus for change came primarily from outside the school setting, and the new materials were introduced into the schools, in many cases imposed upon them, with little attention paid to the existing institutional culture or its social and psychological concomitants.

In the settings observed, teachers were trained in the new math in summer workshops in highly traditional fashion as if this were a standard problem of imparting knowledge and developing skills, with little recognition given to the difficulties entailed in having to unlearn highly overlearned ways of thinking at the same time that new modes of conceptualizing were to be acquired. The teachers had unanticipated difficulty in learning the new material to a degree comparable to their grasp of the old curriculum, which itself was hardly at a level that could be characterized as decisive mastery--it was typically more like an uneasy truce achieved after years of struggle. They were obliged to embark on the new enterprise with very little supervision--nowhere near enough to bolster the tentative understanding or dispel the attendant apprehensiveness. Nonetheless, they settled down, as is their wont, to teach in the way in which they themselves had been taught.

One consequence of such an emphasis upon materials and curriculum content is that all those far-reaching goals and intended outcomes concerning the development of positive affect and thinking skills and manpower resources are lost sight of, and the development and delivery of the means becomes a goal in itself. The whole enterprise then tends to be evaluated

in terms of the successful accomplishment of the engineering objective of substituting one set of textbooks for another.

There are several implications of all this for research methodology, and one of them relates to the formulation of the problem: The question of how change is to be produced is not only an engineering problem but a research problem. The process of change in each instance should be conceptualized in such a way that it appropriately takes into account the complexities and dimensions of differentiation of the cultural setting in which change is to occur. This means that we need to develop procedures for uncovering the relevant dimensions and relationships, as well as alternative techniques for dealing with them. Since it is unlikely that proposed change will have the same significance for all of the different parties and groupings involved in the setting, the social forces surrounding change are likely to be multiplex. The change process, then, must be differentiated and flexible to be able to capitalize upon existing sources of support, to recruit additional support as needed, or to confront the forces of opposition.

The catch in all this is that we need a considerable amount of information about existing regularities and social forces in order to conceptualize the change process realistically in the first place. The usual reaction to this state of affairs is to urge the external advocate of change to immerse himself in the situation to get a feel for the interacting forces and vested interests before attempting specific interventions. This is all well and good, but it takes time and is rarely done systematically enough to permit generalization to other settings or even to provide a verifiable data base to substantiate what often turns out to be a private view of system functioning. Another tack is to encourage change from within

the system by participants who know the territory well. But there is no guarantee that participation per se will provide a clear or unbiased view--quite the contrary. Nor can we assume any intrinsic relationships between familiarity with the setting and one's conception of the change process or of the requirements of experimental intervention. Still another approach is to move outside the existing system and attempt to construct a new system under less constrained circumstances. The hope here is that a parallel system offering clear demonstrations of exemplary practice will somehow move the old systems to emulate it, but there are vast differences between creating a new system and changing an existing one.

Techniques for Monitoring Change

What we need is a systematic basis for understanding the system. We need methodologies for objectively determining and describing basic characteristics of system functioning and for evaluating both the changes in those characteristics and the efficacy of the change process in relation to intended and unintended outcomes of the system and of intervention programs.

One possibility might be to introduce into school systems a continuous program of information collection and analysis to uncover existing consistencies and structures and to monitor their perturbations over time. Such an information and assessment program would have to be comprehensive enough to assess a wide range of student outcomes representing intended and unintended consequences of the educational system, as well as characteristics of teachers, students, administrators, programs, and settings that might interact with each other to produce differential results. It would also be particularly important to include some provision for observing and documenting

those most critical of all regularities occurring between teacher and student in the classroom. Given the cultural basis of much system functioning, it would be vital to incorporate procedures for assessing the attitudes and values, roles and relationships, perceptions and expectations, and aspirations and goals of the various parties to the system and to attempt to unravel dimensions of consensus and contention permeating the social matrix. With such a multiplicity of components, it is obvious that the program would have to include an analytical methodology capable of multivariate, longitudinal, and interactional comparisons to provide mechanisms for disentangling the threads of multiple covariation. Ultimately such an assessment effort should attempt to go beyond the description of system functioning as it exists to the development of causal models relating prior conditions and processes to outcomes, perhaps through the use of computer simulation techniques, so that potential consequences of alternative action programs could be systematically anticipated.

An intervention project could be introduced into an educational system being monitored in this fashion with prior warning about existing social pressures and with periodic feedback enabling adjustments of the change process. The impact of the intervention could then be systematically evaluated, in straightforward if not routine manner, in terms of changes in measures of behavioral regularities, especially student outcomes.

Such a comprehensive assessment program is an ideal that would require considerable time and effort to realize. It offers the advantages of a wide range of information bearing on administrative and instructional decision making, evaluation, and accountability, and in the long run could serve as a vehicle for continuing research on the functioning of educational

systems. As a continuing program, it would also provide an early warning system signaling the appearance of new types of students and new or changing conditions, thereby permitting timely modifications in system functioning to accommodate to new inputs and circumstances. Its major disadvantages are the time and resources required to develop, implement, and maintain it.

There are several alternatives to this strategy, of course, and one of them is of particular interest because of its responsiveness to the time pressures for change. The foregoing research strategy gains much of its power for evaluating and understanding change by introducing interventions in the course of an information collection program. The alternative to be considered next reverses the sequence and introduces information collection in the course of an intervention program.

Time for Change

One of the most serious difficulties in developing acceptable research methodologies for educational change is the widespread adoption of a consistently warped time perspective for viewing change. Over and over again, with exasperating consistency, the time required to initiate real change and to cumulate lasting effects is woefully underestimated. As a result, much educational planning is based upon relatively brief experiences with programs, and decisions are frequently made to initiate programs--or to terminate them--on the basis of short-term evidence, usually obtained from ad hoc studies. This can be particularly devasting when a promising developmental program is subjected to summative evaluation prematurely.

Although there are inherent dangers in making long-range policy decisions on the basis of short-term research, in a time of pressing social

problems and rapid social change the alternative of basing such policy decisions on long-term research does not appear to be particularly viable either. The problems are simply too pressing and the conditions changing too rapidly for us to postpone action pending the results of long-term research and development efforts that might increase the likelihood of widespread positive effects. Action is needed now. But neither can we afford the wasted time and resources of inadequately researched programs that turn out to be ineffective. There are strong pressures not only for action but for accountability.

One strategy that appears to offer some promise in the face of such conflicting pressures is to do both things at once--both initiate the action program and conduct research on the effectiveness and consequences of the action at the same time. Specifically, this approach calls for the undertaking of evaluative research on a continuous basis as an integral part of intervention program efforts. That is, once the action program is provisionally formulated on the basis of the best available knowledge and previous research, we would then proceed to carry out both the program and the evaluative research simultaneously. This would be accomplished by including within the administration of the program provision for collecting information relevant to its evaluation and improvement. The level of the research effort, of course, should be appropriate to the magnitude of the program, to the soundness of the prior basis for the program, and to the potential consequences of program failure. There would thus be no delay in program implementation, but at the same time the research would be as long-range as the program was.

By periodically monitoring program effectiveness, this continuous evaluative research would process data bearing directly on questions of

program evaluation and accountability. But it would also provide information relevant for improving the program, as well as for modifying the program to accommodate to new types of students and new or changing conditions. Such continuous evaluative research would thus provide at the program level a rational basis for adaptive action (Messick, 1970; Messick & Barrows, 1972).

Testaments for Change

Let us now turn to questions of the source and direction of change, of the origin of ideas for new plans and new aspirations in education. At first glance it might appear that in a rational enterprise like education these ideas derive from a careful examination of evidence, that they represent direct implications of the findings of research. But let us analyze that notion for a moment. Consider, for example, a body of evidence indicating that a large part of man's behavior is shaped and maintained by its consequences, which are under the control of environmental contingencies.

Consider next a social or educational theorist like Skinner (1971) having a particular conception about the nature of man--"not of a body with a person inside, but of a body which <u>is</u> a person in the sense that it displays a complex repertoire of behavior [p. 199]." He might reason from such evidence somewhat as follows: Since man is controlled by his environment and the environment can be manipulated, we should use a technology of behavior to engineer a society having sufficient controlling contingencies to maintain socially desirable and productive behavior. If this means that autonomous man, the inner man, is being abolished, "That is a step forward," according to Skinner (1971, p. 215). "His abolition has long been overdue," he maintains. for "only by dispossessing him can we turn to the real causes of human behavior [p. 200-201]."

Now consider another theorist viewing the same data but with a different conception of the nature of man--"To say that a man is a person is to say that in the depth of his being he is more a whole than a part and more independent than servile."[2] Such a theorist would reason very differently. He might see behavior control by environmental contingencies as a problem for education, not a solution, and strive to bring the operation of those contingencies into the awareness of students in an attempt to reduce the preemptiveness of conditioned behavior. We might then create, by a process more akin to societal guidance than to social engineering (Etzioni, 1968, 1970), a society that is not beyond freedom and dignity, one with enough alternative opportunities to challenge the individual to choose, freely and responsibly, those environmental contingencies that will come to maintain his behavior. In this kind of society, autonomous man lives on, for "freedom is found in that kind of interaction which maintains an environment in which human desire and choice count for something [Dewey, 1922]."

What is at issue in this example is not the research findings, although there is indeed controversy over the consistency of results in this area with human subjects. What is at issue is ideology. It is not the implications of research results <u>per se</u> that are to be implemented in the proposed strategies, it is the implications of research as interpreted or filtered through a particular ideology about the nature of man and society. In this sense, research does not directly determine the aims of educational practice or educational change, nor should we expect it to. It instead serves to refine, to justify, and in its finest moments to challenge directions that are primarily ideologically determined. Its

most powerful impact comes on those rare occasions when it stimulates a change in the mediating conceptions, especially when it produces a change in our conception of the human being as a learner.[3]

Several such conceptual changes have occurred in education in the past fifty years or so, and serious attempts were made to implement the implications of the new conceptions in practice--as when we shifted from the notion of the learner as an empty organism to that of the learner as a dynamic organism, to that of the learner as a social organism, to that of the learner as an inquisitive, stimulus-seeking organism, etc. One of these conceptual changes occurred fairly recently in early childhood education when research with very young children indicated that they can indeed learn cognitive skills and meaningfully process symbolic and semantic information, thereby shaking our general assumptions about the maturational limitations of young children and their readiness for systematic educational experiences prior to some magical "school age."

The history of these major conceptual shifts is not particularly encouraging, however, for they tend to represent fairly global reformulations in viewpoint while the phenomena they refer to almost certainly require more differentiated treatment. The human learner may indeed function as a social organism, to be sure, but might he not also function as a dynamic organism as well? And as an inquisitive organism? And even as a partly-empty organism? And more as one than another at different times and under different circumstances? Historically, attempts to implement the implications of each new viewpoint have tended to be relatively single-minded, resulting not only in marked pendulum swings in practice but pendulum swings in different directions. There has thus been considerable

change on the educational scene over the years but not necessarily very much progress.

Given the central role of ideology in determining aims and action in education, it would seem imperative that we undertake systematic analyses of how ideological dispositions affect action through the medium of judgment and decision making (Dewey, 1964; Stake, 1970). This would require measurement methodologies, perhaps techniques of multivariate analysis or multidimensional scaling, for assessing consistent individual viewpoints about the nature of man and the aims of education and society and for developing an articulated description of each viewpoint in terms of the structure of interrelationships among its component values (Jackson & Messick, 1963; Tomkins, 1963; Tucker & Messick, 1963; Uhl, 1971). An understanding of the structure of different value systems would be particularly important in attempting to trace their interaction in areas of consonance and confrontation. Different ideologies may exhibit substantial degrees of overlap in shared values, for example, while a particular ideology may contain potentially conflicting value components that do not always lead to mutually supporting implications. The personality and environmental correlates of these viewpoints could also be examined for clues as to their origins and the conditions under which they are likely to predominate.

With this kind of strategy, we might then be able to relate differences in educational objectives to characteristics of decision makers, their underlying values, and their situational constraints. By evaluating the empirical consequences of action programs in terms of structures of interrelated values instead of lists of objectives, we would also be better able to appraise in systematic fashion the import of unintended as well as intended outcomes.

To recapitulate briefly, it looks as if the nature of the thing to be changed, the educational arena, is not only a complex system composed of many constituents but a complex culture comprising multiple roles and pluralistic values, and that if we are to understand the functioning of that system--or to change it--we must take into account the interplay of those roles and values in supporting (or subverting) system regularities. We have seen further that the sources and direction of change are also primarily a function of value perspectives and that individual and social values must, therefore, play a central role--often implicitly, to be sure--in educational planning and policy making. The implications of these points for research methodology seem clear. We need methodologies that no longer strive after Max Weber's perverse ideal of a value-free social science, but rather methodologies that are openly value-centered (Gouldner, 1962).

In short, although the methods of empirical social science research are typically employed to guide means-judgments, usually by investigating effectiveness and efficiency, the proposed strategy calls for the application of social science methodology to help understand ends-judgments and to clarify and improve means-ends decisions. If this approach doesn't exactly make valuation a social science, it would at least make the educational applications of social science more valuative (Dewey, 1970; Edel, 1970).

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Footnotes

[1]Many of the points made in this section are summarized from Seymour B. Sarason's illuminating book, The Culture of the School and the Problem of Change (Boston: Allyn & Bacon, 1971). The interested reader is referred to that source for an elaboration of the issues.

[2]Jacques Maritain, quoted in J. P. Bradley, L. F. Daniels, & T. C. Jones (Eds.), The International Dictionary of Thoughts. Chicago: J. C. Ferguson Publishing Co., 1969. P. 465.

[3]Jacob Getzels, Paradigms and Practices in the Contribution of Research to Education. Paper presented at the Project Aristotle Conference, Washington, D. C., 1967.